

REMARKS

The Office Action mailed January 13, 2005 has been carefully reviewed and the following remarks are made in consequence thereof.

Claims 1-29 are now pending in this application. Claims 1-31 stand rejected. Claims 30 and 31 have been canceled.

The rejection of Claims 1-31 under 35 U.S.C. §112, first paragraph is respectfully traversed.

Applicants respectfully submit that Claims 1 and 15 have been amended in response to examiner interviews dated September 2, 2003 and October 28, 2004. Specifically, the undersigned spoke with the Examiner in a telephonic interview on September 2, 2003, in which the difference between attitude and heading as they relate to the present invention and prior art references was discussed. Although no agreement was reached on the pending claims, there was agreement on the difference between the present invention and an “aircraft that moves in reverse when moving on the ground at an airport.” As a result, Claims 1 and 15 were amended to clarify the meaning of a heading by reciting a “locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives.” Furthermore, the undersigned spoke with the Examiner on October 28, 2004, in which the 35 U.S.C. § 112, first and second paragraph rejections of Claims 1 and 15 were discussed. Applicants have amended Claims 1 and 15 in accordance with those discussions to place the application in condition for allowance. Specifically, Claims 1 and 15 were amended to recite “wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.” The amendments were made in order clarify the claim language regarding the term “heading” for the Examiner’s benefit and not as a limitation or new matter.

With respect to the assertion that there is no basis in the original specification for the limitation “wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel”, Applicants respectfully disagree and submit that the application as filed, does in fact support the above-referenced claim limitation. The Federal Circuit has opined in *Verve LLC v. Crane*

Cams, Inc., 65 USPQ 2d 1051, 1053-1054 (Fed. Cir. 2002), that “[p]atent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field.”

Applicants respectfully submit that one of ordinary skill in the art, after reading the specification in view of the Figures, would agree that the subject matter in the specification is described in such a manner as to reasonably convey that the Applicants have possession of the claimed invention, at the time the application was filed. Furthermore, it is readily known in the art that as a vector quantity, the vector distance between the two antennas has both a magnitude component and a direction component. The method of the present invention uses the two antennas to determine the vector distance between the two antennas. The two antennas are mounted on the locomotive spaced apart by a known distance magnitude. With the vector distance between the two antennas known and the distance magnitude between the two antennas known, it is elementary to determine the direction component of the distance vector. Further, each GPS system determines the absolute position of its respective antenna. Accordingly, the direction component of the heading vector of the longitudinal axis of the locomotive is known and the absolute position of each antenna is known, therefore the heading of the locomotive is known and which antenna is in the lead is known (from the absolute position). Applicants respectfully submit that the original specification describes an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.

Applicant submits that the specification as originally filed is complete and does describe the limitation such that at one skilled in the art would understand the present invention. For example, at page 1, lines 6-7 the specification recites the invention as “determining movement and direction of a track-bound transportation apparatus using GPS satellites.” Applicants respectfully submit that the level of skill in the art of locomotive operation, and specifically direction of travel of the locomotive and which end of the locomotive is in the lead in the direction of travel is sufficiently high that the ordinary skilled

artisan would be able understand what is meant by determining movement and direction of a track-bound transportation apparatus using GPS satellites.

Furthermore, at page 6, line 6, for example, heading is recited as being equal to “ $\tan^{-1} d_x/d_y$ ”, wherein d_x and d_y are vector components of the vector distance between the two antennas, within an x , y , and z coordinate system, defined on page 5, lines 3-4 as being referenced to “east, north and up, respectively.” Applicants respectfully submit that the level of skill in the art of locomotive operation, and specifically direction of travel of the locomotive and which end of the locomotive is in the lead in the direction of travel is sufficiently high that the ordinary skilled artisan would be able understand what is meant by the term “heading” as modified by the phrase “wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel” and its corresponding cited formula above. Accordingly, Applicants submit that Claims 1-31 meet the requirements of section 112, first paragraph.

For the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-31 be withdrawn.

The rejection of Claims 1, 2, 5-9, 12-16, 19-23, 28, and 29 under 35 U.S.C. § 103(a) as being unpatentable over Bidaud (U.S. Pat. No. 6,347,265) in view of Ford (U.S. Pat. No. 6,211,821) is respectfully traversed.

Bidaud describes a track analyzer included on a vehicle (28) traveling on a track (10) that includes a vertical gyroscope (20) for determining a grade and an elevation of the track. A rate gyroscope (50) determines a curvature of the track. A speed determiner (70) determines a speed of the vehicle relative to the track. A distance determiner (91) determines a distance the vehicle has traveled along the track. Also, the direction in which the vehicle is moving, meaning forward or backward, is determined by whether the phase of a first plate (112) leads/lags the phase of a second plate (114). Notably, Bidaud does not describe nor suggest a method for determining a set of phase differences between satellite reference signals received by satellite receivers.

Ford describes a heading (multipath) sensor (70) including a primary receiver (45) which is configured to receive a positioning signal (51) from a primary antenna (41). The

heading sensor also includes a secondary receiver (47) configured to receive a positioning signal (53) from a secondary antenna (43). Both receivers send an output (57 and 59) to a computational unit (60), respectively. The heading sensor uses differences in carrier observations made at the primary antenna and the secondary antenna to generate a baseline vector (49) and produce five double difference observations. Notably, Ford does not describe nor suggest a method for determining a set of phase differences between satellite reference signals received by satellite receivers *during normal locomotive transit operation*, rather Ford describes a method for using a multipath sensor if *the system is stationary* (Col. 4, lines 23-24).

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art at the time the invention was made to “use the teaching of Ford in the invention of Bidaud because such modification would provide a low cost reliable alternative to a gyrocompass pair as stated by Ford on line 45, on column 1.” More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, “to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.” In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01. Moreover, the Federal Circuit has determined that:

[I]t is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that “[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.”

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, “it is impermissible...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaack, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor

motivation to combine the cited art, nor any reasonable expectation of success has been shown.

Although it is asserted within the Office Action that Bidaud teaches the present invention except for providing at least two satellite signal receivers on the locomotive at spaced locations along the length of the locomotive, determining a set of phase differences between satellite reference signals received by at least two satellite receivers, and determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, and that Ford teaches providing at least two satellite signal receivers on the locomotive at spaced locations along the length of the locomotive, determining a set of phase differences between satellite reference signals received by satellite receivers, and determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, no motivation nor suggestion to combine the cited art has been shown. Rather, Applicants submit that Ford teaches away from Bidaud in that Ford describes a system that utilizes a multipath sensor to determine four parameters, while in contrast, Bidaud describes a track analyzer that utilizes a vertical gyroscope to determine a grade and an elevation of a track. Furthermore, Ford describes a system that utilizes at least two satellite signal receivers on a locomotive to correct a magnetic sensor output or replace a poor or unavailable positioning signal, while in contrast, Bidaud describes a track analyzer that utilizes a vertical gyroscope to correct a plurality of parameters. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 1, 2, 5-9, 12-16, 19-23, 28, and 29 be withdrawn.

Moreover, if art “teaches away” from a claimed invention, such a teaching supports the non-obviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit, as described above, that Ford teaches away from Bidaud, and as such, thus supports the non-obviousness of the

present invention. Consequently, the presently pending claims are patentably distinguishable from the cited combination.

In addition, and to the extent understood, no combination of Bidaud and Ford, describes or suggests the claimed invention. Specifically, Claim 1 recites a method that includes “determining an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.”

No combination of Bidaud and Ford, describes or suggests the method recited in Claim 1. Specifically, no combination of Bidaud and Ford, describes or suggests a method for determining an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals. Rather, in contrast to the present invention, Bidaud describes a track analyzer for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving using a gyroscope and Ford describes a method for using a multipath sensor to determine parameters in a stationary system. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Bidaud in view of Ford.

Claims 2, 5-9, and 12-14 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2, 5-9, and 12-14 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 2, 5-9, and 12-14 likewise are patentable over Bidaud in view of Ford.

Claim 15 recites an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes “at least two phase-locking satellite receivers configured to reference signals received from a set of satellites...a processor configured to determine a set of phase differences between the reference signals received by said satellite

receivers and an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.”

No combination of Bidaud and Ford, describes or suggests an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear as recited in Claim 15. Specifically, no combination of Bidaud and Ford, describes or suggests a processor configured to determine a set of phase differences between the reference signals received by the satellite receivers and an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive. Rather, in contrast to the present invention, Bidaud describes a track analyzer for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving using a gyroscope and Ford describes a method for using a multipath sensor to determine parameters in a stationary system. Accordingly, for at least the reasons set forth above, Claim 15 is submitted to be patentable over Bidaud in view of Ford.

Claims 16, 19-23, 28, and 29 depend, directly or indirectly, from independent Claim 15. When the recitations of Claims 16, 19-23, 28, and 29 are considered in combination with the recitations of Claim 15, Applicants submit that Claims 16, 19-23, 28, and 29 likewise are patentable over Bidaud in view of Ford.

For at least the reasons set forth above, Applicants respectfully requests that the Section 103 rejection of Claims 1, 2, 5-9, 12-16, 19-23, 28, and 29 be withdrawn.

The rejection of Claims 3, 4, 17, 18, 30, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Bidaud in view of Ford as applied to Claims 1, 2, 15, and 16 above, and further in view of Wilson (U.S. Pat. No. 6,313,788) is respectfully traversed.

Bidaud and Ford are described above. Wilson describes a method for determining inter-antenna baselines using an antenna configuration (200) including a pair of relatively closely spaced (D1) antennas and other pairs of distant (D2) antennas. The closely spaced

pair provides a short baseline having an integer ambiguity that may be searched exhaustively to identify the correct set of integers. The short baseline is used to aid in determining longer baselines, that once determined, may be used for accurate run time attitude determination.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art at the time the invention was made to “use the equations of Wilson in the invention of Bidaud and Ford because such modification provides a mathematical way to determine d, or as more commonly known, the baseline vector.” More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, “to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.” In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01. Moreover, the Federal Circuit has determined that:

[I]t is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that “[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.”

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, “it is impermissible...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown.

Although it is asserted within the Office Action that Bidaud and Ford teaches the present invention except for determining d using the equation in the claims, and that Wilson teaches using the equation in the claims to determine d, no motivation nor suggestion to combine the cited art has been shown. Rather, Applicants submit that Bidaud teaches away

from Ford and Wilson in that Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving using a gyroscope, while in contrast, Ford teaches a method for using a multipath sensor to determine parameters in a stationary system and Wilson teaches a method for determining an inter-antenna baseline. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 5, 10, 11, 19, and 24-27 be withdrawn.

Moreover, if art “teaches away” from a claimed invention, such a teaching supports the non-obviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit, as described above, that Bidaud teaches away from Wilson, and as such, thus supports the non-obviousness of the present invention. Consequently, the presently pending claims are patentably distinguishable from the cited combination.

In addition, and to the extent understood, no combination of Bidaud, Ford, and Wilson, describes or suggests the claimed invention. Specifically, Claim 1 recites a method that includes “determining an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.”

No combination of Bidaud, Ford, and Wilson, describes or suggests a method as recited in Claim 1. Specifically, no combination of Bidaud, Ford, and Wilson, describes or suggests a method for determining an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of

phase differences between the satellite reference signals. Rather, in contrast to the present invention, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving using a gyroscope, Ford describes a method for using a multipath sensor to determine parameters in a stationary system, and Wilson describes a method for determining inter-antenna baseline. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Bidaud in view of Ford and Wilson.

Claims 3 and 4 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 3 and 4 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 3 and 4 likewise are patentable over Bidaud in view of Ford and Wilson.

Claim 15 recites an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes “at least two phase-locking satellite receivers configured to reference signals received from a set of satellites...a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel.”

No combination of Bidaud, Ford, and Wilson, describes or suggests an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear as recited in Claim 15. Specifically, no combination of Bidaud, Ford, and Wilson, describes or suggests a processor configured to determine a set of phase differences between the reference signals received by the satellite receivers and an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive. Rather, in

contrast to the present invention, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving using a gyroscope, Ford describes a method for using a multipath sensor to determine parameters in a stationary system, and Wilson describes a method for determining an inter-antenna baseline. Accordingly, for at least the reasons set forth above, Claim 15 is submitted to be patentable over Bidaud in view of Ford and Wilson.

Claims 7, 18, 30, and 31 depend, directly or indirectly, from independent Claim 15. When the recitations of Claims 7, 18, 30, and 31 are considered in combination with the recitations of Claim 15, Applicants submit that Claims 7, 18, 30, and 31 likewise are patentable over Bidaud in view of Ford and Wilson.

For at least the reasons set forth above, Applicants respectfully requests that the Section 103 rejection of Claims 3, 4, 17, 18, 30, and 31 be withdrawn.

The rejection of Claims 10, 11, and 24-27 under 35 U.S.C. § 103(a) as being unpatentable over Bidaud in view of Ford as applied to Claims 1, 5, 15, and 19 above, and further in view of Kumar (U.S. Pat. No. 5,896,947) is respectfully traversed.

Bidaud and Ford are described above. Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's (1) tractive wheels and lubricating the top of the rail (TOR) behind the tractive wheels to reduce the resistance of the trailing cars and reduce the locomotive wheel flange wear. The method includes controlling both lubricating units with the same computer controller (2) when a single locomotive (1) is used and two controllers (2F, 2R) located in two different locomotives (1) in the case of a train consist (10).

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art at the time the invention was made to "use the curvature calculated by the invention of Bidaud and Ford to dispense the lubricant of Kumar because such modification would provide a source of the curvature value of Kumar." More specifically, it is respectfully submitted that a prima facie case of

obviousness has not been established. As explained by the Federal Circuit, “to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.” In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01. Moreover, the Federal Circuit has determined that:

[I]t is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that “[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.”

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, “it is impermissible...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown.

Although it is asserted within the Office Action that Bidaud and Ford teach the present invention except for dispensing track lubricant in accordance with track curvature when the curvature is greater than a predetermined magnitude, or based on the curvature value contained on a track database, and that Kumar teaches dispensing track lubricant in accordance with track curvature and when the curvature exceeds a predetermined magnitude, no motivation nor suggestion to combine the cited art has been shown. Rather, Applicants submit that Bidaud teaches away from Ford and Kumar in that Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the direction in which the vehicle is moving using a gyroscope, while in contrast, Ford describes a method for using a multipath sensor to determine parameters in a stationary system and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a

locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 10, 11, and 24-27 be withdrawn.

Moreover, if art "teaches away" from a claimed invention, such a teaching supports the non-obviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit, as described above, that Bidaud teaches away from Ford and Kumar, and as such, thus supports the non-obviousness of the present invention. Consequently, the presently pending claims are patentably distinguishable from the cited combination.

In addition, and to the extent understood, no combination of Bidaud, Ford, and Kumar, describes or suggests the claimed invention. Specifically, Claim 1 recites a method that includes "determining an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

No combination of Bidaud, Ford, and Kumar, describes or suggests a method as recited in Claim 1. Specifically, no combination of Bidaud, Ford, and Kumar, describes or suggests a method for determining an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals. Rather, in contrast to the present invention, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the track, and the

direction in which the vehicle is moving using a gyroscope, Ford describes a method for using a multipath sensor to determine parameters in a stationary system, and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Bidaud in view of Ford and Kumar.

Claims 10 and 11 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 10 and 11 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 10 and 11 likewise are patentable over Bidaud in view of Ford and Kumar.

Claim 15 recites an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear, with the locomotive oriented with either end of the locomotive in the lead in the direction of travel of the locomotive wherein the apparatus includes "at least two phase-locking satellite receivers configured to reference signals received from a set of satellites...a processor configured to determine a set of phase differences between the reference signals received by said satellite receivers and an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive during normal locomotive transit operation using the set of phase differences between the reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel."

No combination of Bidaud, Ford, and Kumar describes or suggests an apparatus for determining at least one of motion and location parameters of a railroad locomotive to detect curves and reduce track wear as recited in Claim 15. Specifically, no combination of Bidaud, Ford, and Kumar, describes or suggests a processor configured to determine a set of phase differences between the reference signals received by the satellite receivers and an accurate heading, accurate heading rate, attitude, and attitude rate of the locomotive. Rather, in contrast to the present invention, Bidaud describes a track analyzer included on a vehicle traveling on a track for determining a grade and an elevation of the track, a curvature of the track, a speed of the vehicle relative to the track, a distance the vehicle has traveled along the

track, and the direction in which the vehicle is moving using a gyroscope, Ford describes a method for using a multipath sensor to determine parameters in a stationary system, and Kumar describes a method for simultaneously lubricating the rail gage side (RAGS) and wheel flanges ahead of a locomotive's tractive wheels and lubricating the top of the rail (TOR) behind the locomotive's tractive wheels. Accordingly, for at least the reasons set forth above, Claim 15 is submitted to be patentable over Bidaud in view of Ford and Kumar.

Claims 24-27 depend, directly or indirectly, from independent Claim 15. When the recitations of Claims 24-27 are considered in combination with the recitations of Claim 15, Applicants submit that Claims 24-27 likewise are patentable over Bidaud in view of Ford and Kumar.

For at least the reasons set forth above, Applicants respectfully requests that the Section 103 rejection of Claims 10, 11, and 24-27 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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